



Chambers's Journal

SIXTH SERIES.

NATTER JACKS.

IN the course of my spring and summer rambles on the East Anglian marshes, I often visit a lonesome tract of salt-marsh lying not far from the coast. The salt tide of a river-estuary washes the southern border of the marsh, and deposits there a dark stain of coal-dust, intermingled with broken cork net-floats, clusters of whelks' eggs, shellfish, and the 'wheelbarrows' of the skate. Sea-gulls and hooded crows are often seen on its oozy shores in winter, when they come there to feed on the stranded sea-wrack; and then, too, one may hear the harsh screeching of dunlins and the plaintive pipings of the beachmen's 'sand-larks,' the ringed plovers. Lapwings often wheel above the marsh, and I have found their nests not far from the rush-fringed salt pools; and snipe may be flushed from amid the rank aquatic grasses. In summer some of the fairest of our fen flowers bloom there, such as the beautiful marsh orchids and pale-pink bog-beans; while in autumn the tall sea asters wave their daisy-like blossoms amid the rushes and sedges.

After the end of March, when there is warmth in the sunshine, and the golden blooms of the marsh-marigolds deck the dikesides, I often hear, while rambling along the borders of the marsh, a curious trilling that makes the air seem tremulous. It comes from the dikes which intersect the marsh, and is not the trilling of a flock of warblers, hidden by the reeds, but the love-song of the natterjacks. It is difficult to describe the sound, and I can only say that it somewhat resembles the distance-deadened song of a night-jar, or what one might imagine to be the effect of the grasshopper-warbler's 'grinding' robbed of its metallic shrillness. When first I heard it I was much puzzled as to its origin; but a marshman whom I interrogated on the subject told me that it was made by 'them there runnin' toads, an' he an' his mates often called 'em marsh-birds.' Since then I have often come across the natterjack in the course of my marshland wanderings; and a better acquaintance with it has impressed upon me

the fact that it is one of the most interesting of our few British reptiles.

The natterjack toad was first discovered in England about the middle of the eighteenth century, when it was found in Lincolnshire by Sir Joseph Banks, who reported his discovery to Thomas Pennant, the naturalist friend of Linnaeus and correspondent of Gilbert White of Selborne. Pennant devoted much time to the observing of frogs and toads; and in White's letters to him we find references which prove that they were in the habit of comparing notes concerning these familiar reptiles. Not much, however, was learnt about the natterjack, which was considered a very rare species in this country; for at the end of the last century Sir Joseph Banks wrote: 'The *rubeta*, or natterjack, frequents dry and sandy places. It is found on Putney Common, and also near Reversby Abbey, Lincolnshire. It never leaps, neither does it crawl with the slow pace of the toad; but its motion is liker to running. Several are found commonly together, and, like others of the genus, they appear in the evenings.' This is all that was known of the natterjacks in Sir Joseph Banks's day, except that among the Lincolnshire fenmen they were called 'Boston waites' and 'Dutch nightingales.'

Unlike the common toad, the natterjack is a decidedly local species; it is fairly abundant in some districts, and entirely absent from others. It is supposed to be indigenous in the south-west of Ireland, where, like common toads and frogs, it apparently escaped the exorcism of St Patrick; and in some of the eastern counties of England it is almost as numerous as the common species; but, although most plentiful in marshy districts, it only resorts to the water during the breeding season, and is quite capable of existing for months together in dry places. There is little doubt, however, that it has a partiality for marshes; and that it prefers those not far from the sea is indicated by its presence in the fenny localities of Norfolk, Suffolk, Lincolnshire, Lancashire, Cheshire, Dorset, Hampshire, and Cambridgeshire.

There is no difficulty in distinguishing between the natterjack and common toad, for the former is smaller than the latter, and, as its name of 'walking' or 'running' toad implies, has a different mode of progression. The common toad is, as Shakespeare says, a 'heavy-gaited' creature; but the natterjack is more agile in its movements, and when disturbed will 'walk' or 'run' fairly fast. To see a toad elevate its body and run strikes one as a somewhat curious sight at first; but the natterjack can not only run, but can climb over obstacles that might well be imagined impassable to it. I have seen a natterjack comfortably installed upon the top of a log that lay beside a lowland dike, and from the complacent manner in which it sat and gazed about it one might have supposed it was proud of its climbing powers. When, at the commencement of the breeding season, it starts off from its winter quarters for the marsh dikes, it allows nothing—not even an ivy-clad garden-wall—to hinder its advance. Like many other creatures, it has a way of shamming death when in danger, and it does this so cleverly that even the marshmen, who, while they are dike-drawing, come across plenty of natterjacks, have been deceived. 'They're curious warmins,' said one of these men of the marshes, 'for you may see 'em lyin' spread out near th' deeks, lookin' jist as if some one had stamped on 'em an' squashed 'em; an' if you pick 'em up they 'ont move unless you give 'em a good tidy nip.' The Norfolk fenmen, according to Dr Emerson, have a 'rockstaff,' or proverb, 'that a man can quiet the most restive horse with the bone of a running toad.'

The natterjack has shorter hind-legs than the

common toad, more conspicuous eyes, and less webbed feet. Its body is of a yellowish-brown colour, with dark-greenish cloudings; and along the middle of its back runs a thin bright-yellow line. The male possesses a vocal sac, which is absent in the common species, and which only reaches its fullest development in the green toad of the Continent. This sac renders its trilling much louder than it would otherwise be. The species deposits its spawn in the usual way of batrachians, and its young assume the tadpole form, though the tadpoles are smaller and darker than those of the common toad. It has been estimated that the female lays as many as nineteen thousand eggs; but this is not too great a number when it is considered how many tadpoles are destroyed by fishes, newts, and the larvæ of dragon-flies, and that water-fowl and fish at times gorge themselves with the spawn. Bell, in his *British Reptiles*, even goes so far as to say that the tadpoles eat each other; but although I have reared a good many of them, I have never seen anything that suggested such a thing. Worms and insects are the favourite food of the species, which has a long tongue, to assist it in catching the latter. A naturalist who kept some natterjacks in his garden observed that they were fond of lying exposed to the full glare of the summer sun, and that while enjoying their sun-baths they were ever on the alert for such insects as came within their reach.

The scientific name of the species is *Bufo calamita*; and its English name, if not derived from the provincial word *natter*, to be querulous, find fault, nag (used by George Eliot in *Adam Bede*), in allusion to its voice, is presumably from the Anglo-Saxon *nædre*, an adder.

THE LOST CAUSE.

CHAPTER VII.—THE SETTLING OF AN OLD SCORE.

FOR a time my lord was silent, and busied himself in so arranging his cloak and wraps as to ensure the utmost warmth and comfort—a matter of no small consequence on a cold winter day. We had reached the open country before he turned to me, his eyes dancing with merriment.

'Why so glum, man of little faith?' he asked.

'Frankly, my lord, I like the affair less than ever,' said I.

'And cannot credit me with some degree of method in my madness? Fie, George! Come, am I in the habit of doing anything without a purpose?'

I had to confess that he was not.

'But, in this case, you cannot conceive what it is? Well, for your sins, you are not to learn it yet awhile!' He leaned back in his corner, laughing quietly to himself. 'A single hint!'

he said, continuing. 'We have been playing a comedy, some old friends and I—even you have had, unconsciously to yourself, a part in it—and I am vastly in error if the curtain is not about to rise on the last act. Then you will see—what it may surprise you to see, my lad.'

'But . . . I don't understand!'

'I have no intention that you should,' said he cheerfully. 'To divulge the secret beforehand would only spoil your enjoyment of the play. . . . *À propos*, have you ever helped to trap a fox? If you have, you will know that 'tis no easy task, and that the bait must be delicate and skilfully laid. That, in a word, is why we are here at this moment.'

'And we are the bait?' I cried, as his meaning began to dawn upon me, albeit but dimly.

'I am, to be precise. And, if all goes as I hope, I think I can promise you some entertainment within the next hour or two. That being

so,' he went on, 'I have a favour to ask. I have had little sleep for two nights past, and would be the better of a nap. You, on your part, are burning to give me your adventures and—confessions, shall I say? Well, I want you to keep the story until we can have it comfortably over a bottle of wine at Devizes, where we lie to-night. Of course, if you must speak, I am at your mercy. But otherwise, I will listen with the devourest attention when we get to the "Bear"—which is more than I may do at present. Is it a bargain?'

I replied that 'twas for him to decide; and indeed, thanks to his hints, I had not now the same consuming desire to unbosom myself. Somehow it seemed less essential.

'Very good,' said he, and at once composed himself in his place. In two minutes he was snoring gently.

For me, what could I do but look out (with unobserving eyes, I fear) at the white landscape that flitted past the steam-clouded window, and permit my imagination free rein? Here I need not set down the thoughts and anticipations that ran through my brain. The reality was not amongst them.

So the coach jolted onward, with many an oath and crack of the whip from the postillions. Considering the late snowfall, our progress was not unsatisfactory; and as we dashed through one hamlet after another, and passed field and hedge and wood, I idly recognised the successive landmarks that I had noted on my ride to Bath the day before. 'Twas scarcely travellers' weather; and, save for a few wagons, a score or two of country folks afoot, and a stray chaise—and these chiefly in the first half-dozen miles—we had an open road. It became more and more deserted as the second hour merged into the third and the afternoon shortened. Latterly, in a long stretch, we met nothing but the London coach. It flashed by to the cheerful music of the horn, and for an instant my lord's slumber was broken.

The next half-hour was without incident, yet I had an increasing feeling of restlessness as the minutes sped. Then, happening to glance out, I observed something (but forget what) that gave me my bearings. I realised that we were approaching the byroad which led to the Dower-house of Langbridge, and so could not be far from the spot where I had encountered the highwaymen. The fact, for some strange reason, added to my foreboding. Sir Charles and Kitty had been much in my mind, and now Craddock (if that were the pad's name) recurred to it; and with the conjunction came a premonition that here, if anywhere, would my lord's comedy be played out. As you are to learn, I was right. Only, 'twas to be a tragedy rather than a comedy.

Indeed, the idea had hardly been formed ere 'twas justified. There was a cry without, fol-

lowed by a frantic rapping on the roof of the coach; my lord woke up with a start; and, pulling the window open, I thrust forth my head. As I did so, I heard Joseph's voice from the rumble:

'Look, sir! . . . There, in front!'

The road took a sharp turn, which we were just rounding; the light was still good, although the dusk was beginning to creep in; and, looking, I saw that which had startled the servant—and now startled me. For there, fifty or sixty yards on, a couple of masked men sat their horses right in our path; and the taller (as I perceived at once) had a black beard, and bestrode a powerful bay with a patch of white on its forehead! In my amazement, I had almost called out: there was no mistaking either man or horse. And, inconceivable as it may seem in those later days, they were plainly determined to stop us—in daylight, and on one of the main highways of England!

'Faster! faster!' I shouted to the postillions. 'Don't pull up—ride them down if they will not give way!'

The men lashed their horses, and I drew in again. Then, having possessed myself of the pistols lying ready on the opposite seat, I turned to my lord. Never had I beheld him more cool.

'Well?' he asked.

'Pads—and the pair who stopped me before!'

Rising, he cast off his wraps. 'Are you quite sure it isn't our fox?' said he, with his quiet smile. 'In any event, George—no violence unless I say the word.'

Suddenly, before I could reply, came a rough jolt; he was thrown against me, and both of us against the door; then another, followed by the shivering of glass; and, as the coach tilted up, 'twas borne upon me that the arguments of a brace of pistols had proved more potent than my command, and the rascally postillions had driven us into the ditch. The sequel was not long delayed. Just as we had picked ourselves up, the far door was pulled open, and the black-bearded pad showed himself, pistol in hand. He regarded us for a minute in silence, and meanwhile a shot cracked outside.

'Twas to me that he addressed himself at last.

'Once more, Mr Holroyd!' said he. 'I am very fortunate! Now I must trouble you to get down—you and his lordship.'

I started on hearing his voice; it sounded not altogether the same as that of my old antagonist, and liker to another that was more familiar to me. Even yet, however, I guessed not the truth.

My lord answered him. 'With pleasure, sir,' he said briskly, and climbed out with the agility of a younger man.

I made haste to follow, and in a glance saw our position. The coach was firmly fixed in the left-hand ditch, while the horses stood quiet,

panting and trembling. The postillions had fled; twenty yards back, they and Joseph were disappearing at their best speed round the turn, leisurely herded by the other highwayman. He it was, no doubt, who had fired to hurry them on.

The same glance also told me exactly where we were. For, some thirty or forty yards Londonwards, I recognised the point at which the road to the Dower-house left the highway. On the main road, which ran on in a straight line for perhaps half a mile farther, not a movement was to be observed. At the spot of our adventure 'twas bounded on one side by a hedge, and on the other by a high park-wall. It struck me that the wall was probably that of Langbridge.

All this I had noticed instinctively; and meanwhile my lord had drawn out his snuff-box, and was calmly awaiting the highwayman's next step. He, on his part, sat his horse motionless until the fleeing trio of servants were out of sight. Then he raised his hand to his face with a quick gesture.

'Enough of this masquerade!' he cried. 'It has served its purpose in frightening these fools, and now it may go!'

The voice was doubtful no longer; and an exclamation of utter astonishment was forced from me as mask and beard dropped to the ground together and the man stood revealed.

'Sir Charles Hollingworth!'

'Twas indeed my cousin—and he and the pad were one and the same.

'Or Squire Craddock—at your service, Cousin George,' said he. 'You had no suspicion? Well, the necessity of war must excuse the former affair. This concerns you less.' He turned at that to my lord, who had shown not the slightest sign of surprise, and just then was taking a pinch of snuff. 'So we have met again—at last,' he remarked to him.

Their eyes encountered; and I knew that two men who hated each other with the deadliest hatred, and could never be aught but enemies, were face to face.

'Oh, I felt sure that my hint would have its proper effect,' said my lord, replacing his snuff-box in his pocket.

'Then you intended this meeting?' Sir Charles's tone had just a shade of perplexity in it.

'Knowing you, I hoped for it.'

'And, having met'—He broke off as his comrade cantered back and pulled up beside him. 'Well, Tom?'

'All clear,' replied the other. 'The cowards will run for a mile before they stop.'

He looked from one to another, hesitated for a moment, and then unmasked likewise. This time I was not unprepared—and had my arm been stronger I should have been yet more

pleased to discover another old acquaintance. I had not forgotten the previous evening.

'You too, Mr Kennett?' cried my lord. 'Still playing for the high stakes, I perceive? Well, young men will.'

He bowed, but said nothing; and after a whispered conversation Sir Charles gave him his bridle, and dismounted. I was still gripping my pistols, and, nodding to me, Kennett proceeded to recharge his. My cousin intercepted the sign, and put his own interpretation upon it.

'Mind, Kennett,' he said meaningly, 'this is a matter betwixt Lord Kynaston and me—and betwixt us alone—and Mr Holroyd has no part in it.'

'Unluckily for me—or for Mr Holroyd,' returned Kennett.

'And as it must be settled speedily, while the light lasts . . . if his lordship, as I am convinced,' he added, again confronting him, 'has no objection . . . why, let us get to business!'

'By all means,' said my lord. 'Twas for that purpose I sought this meeting, having a certain proposal to make you.'

'There can be but one,' said Sir Charles, 'and it need not delay us for long.'

'A moment, if you will pardon me. First, I have to remind you of several facts. Any day these three weeks past I could have laid you by the heels, and you have not taken a single step unknown to me—neither yourself nor one of your accomplices. Your plot, if I may call it so—one expected more from such an old conspirator as Dare-devil Charlie—your plot is dead. 'Twas strangled yesterday—and you know who strangled it.'

'I am not denying that you were cursedly well informed!' burst out Sir Charles.

'So, there being an end of that!—'

'Not quite!' cried the other. 'I trust to end it myself—when your lordship is ready.'

'Oh, I have not done. . . . His Majesty's business being settled, then, I remembered an ancient score of my own. I am here to pay it—and you will guess that I have not come unprepared. To be frank, I expect a reinforcement of half-a-dozen men or so in a few minutes, and I have others on every road within a dozen miles. Thus your friends—all your friends, Hollingworth,' he repeated with a grave significance in his tone—'are at my mercy—unless you choose to accept my offer.'

So the secret was out! I heard a muttered oath from Kennett as he glanced apprehensively round—first along the road, and then at Sir Charles.

'And the offer?' inquired the latter curtly.

'Is simply that you deliver yourself prisoner to me,' answered my lord quietly. 'In that case your friends may go back to exile without hindrance from the government.'

'And in the other case?'

'Of your refusal?' He shrugged his shoulders. 'Then I am afraid there will be lamentation in many noble families—perhaps even in the most exalted.'

The allusion was sufficiently plain, and to me the dilemma that faced Sir Charles seemed a terrible one. But I did less than justice to his readiness of resource.

'A pretty scheme, egad!' he cried. 'Yet, after all, does it not strike you that there is another course? God knows we have little cause to love each other, Kynaston, but at the least let us play the game out like gentlemen! We are man to man: why should we not finish the bout that was interrupted some twenty years ago?'

My lord's face darkened at the recollection. 'The stakes were more level then,' he said. 'Now you have nothing to lose—even your life is forfeit—and everything to gain.'

'Is not that the very consideration that should appeal to you?' asked Sir Charles, with a touch of scorn. Then he turned towards the other, smiling wickedly. 'Or is it that, as ever, my Lord Kynaston trusts to his head rather than his hands for the undoing of his enemies?'

The red flamed into my lord's cheek, and his answer was swift—and uncompromising.

'That is a lie, and you know it, Hollingworth!'

In an instant they had doffed cloaks and gloves and their swords were out. They would have met there and then if I had not intervened.

'Think, my lord'—

He stopped me at once. 'After Sir Charles has had his proof,' he said coldly.

'And you may see fairplay, George,' added Sir Charles, still smiling. 'But had we not better go back a little? We may frighten the coach-horses here. And if you will keep watch at the turn for Lord Kynaston's friends, Kennett'—

'I was just thinking of that,' he said, and rode off at once with the two steeds.

All remonstrance would now have been in vain. Not only did each man stand for a cause: he had an implacable enmity of twenty years to nerve him. The preliminaries were speedily arranged, and surely was never duel so important to be fought under conditions less favourable! The light was fast fading; and at the spot chosen, a dozen yards or thereabout behind the coach, the trodden snow offered but an insecure footing.

I gave the word, and the blades crossed and embraced. Both men had skill beyond the ordinary. Sir Charles I had proved myself, and my lord's reputation was high in the London schools; and now the first minute's play told me that they were well matched. I have not the heart

to write in detail of the keen and relentless struggle that ensued. 'Twas, as I was well aware, a fight to the death; I was bound to both by many ties, and could not witness it unmoved; and with the lapse of time that which remains most clearly in my memory is the impression of the bitter ending.

The issue was long in doubt. For nearly ten minutes the only sounds to be heard were the hard breathing of the combatants and the ring of the steel, and still the advantage was to neither. More than once my heart jumped into my mouth—as when Sir Charles's sword slipped under his opponent's guard and ripped his coat, and again when my cousin saved himself by a marvellous *riposte*. And then, while the result hung in the balance, this shout came suddenly from Kennett:

'Horsemen in sight, and riding fast—they will be on us in five minutes!'

The antagonists did not seem to hear him, and certainly paid no heed. The lust of contest was in their blood, and all else was forgotten. But the end was near. A minute later the good fight was over. Sir Charles's foot slipped as he made a quick *botte*, and before he could recover himself my lord had seized his chance. My cousin fell forward, run through the body.

I was beside him in a second; and Kennett, seeing what had happened, threw himself from his horse and joined me. Together we did our best, which was but little. But Sir Charles, looking up at us with his whimsical smile, shook his head.

'Tis no good—I'm done for at last,' said he faintly. Then: 'Is Kynaston there?'

My lord bent over him.

'Will you shake hands, Kynaston?' he asked.

'You have won the game—and I bear you no grudge. At the least, I have cheated the London mob of a beheading!'

So they clasped hands, those two who had been lifelong rivals and enemies, and had at length settled their dispute. As the winner turned away I could have sworn that the muscles about his mouth were twitching.

Then Sir Charles spoke again: 'Now, Kennett—off with you!' he said.

'I stand or fall with you,' returned the other doggedly.

'You have yourself to think of—and the Prince. . . . He comes first, lad! . . . And Holroyd will see to me.'

Kennett resisted no further. Jumping upon his horse, and taking the bridle of Sir Charles's, he rode off; and as he turned into the byroad and so from my view, I heard the clatter of the approaching reinforcement—which was too late. And, looking, I saw that Sir Charles had fainted away.

FRUIT-FARMING IN SCOTLAND.

By A PRACTICAL MAN.

IN TWO PARTS—PART I.



IN these days of agricultural depression, when the farmer finds it increasingly difficult year by year to make both ends meet, while the landowner is confronted by an annual shrinkage in his rental, it is at first sight a somewhat surprising fact that more attention is not given to the development of the cultivation of fruit. The enormous quantity of fruit, and more particularly of strawberries and raspberries, which is consumed both in its natural state and in the shape of jam, must have led many, both farmers and landowners, to wonder whether they could not participate in the profits of the trade. In the present article it is proposed, without going too deeply into the statistics of the business, to point out some of the difficulties and trials which beset the path of the fruit-farmer in Scotland. There are probably not many outside the trade who are aware what a large industry already exists in the cultivation of what is known as 'small fruit'—that is, of strawberries and raspberries—and, to a much more limited extent, of currants and gooseberries.

In the district to which this article primarily applies, it is the ambition of every cottager to rent or feu a piece of ground whereon to grow fruit; and, though it may appear paradoxical to say so, it is on fruit grown in comparatively small quantities on an acre or two of land that the surest and, proportionately, the largest profits are made. The risks run by a small grower are less, the expense of cultivation is comparatively smaller, and he has greater certainty of finding a market for his fruit than the large farmer; while, naturally, he is not so harassed by the difficulty of obtaining labour.

The great centres of fruit cultivation in Scotland are the Clyde valley, Perthshire, and, to an increasing extent, the neighbourhood of Aberdeen. The farm with the working of which this article is primarily concerned is situated in Perthshire, and the observations as to the cultivation, picking, and despatch of the fruit apply more especially to that district, though—*mutatis mutandis*—the system is much the same in the other districts. Moreover, since the cultivation of gooseberries and currants has not hitherto thriven there—growers being discouraged partly by the length of time elapsing before the bushes become productive, and partly by a blight which has attacked them—these fruits may be dismissed with the remark that the enterprising grower who can afford to wait a while for his harvest will, if he can successfully combat the blight,

reap a rich harvest, since the limited supply of both fruits, and of currants in particular, ensures good prices being obtained.

To grow strawberries and raspberries profitably on anything like a large scale, there are three things essential. The farm must be situated within a sufficiently short distance of a station, to admit of the fruit being easily transported to the markets; it must be near enough to a town to ensure a constant supply of labour on a large scale; and, finally, it is obvious that the land must be well adapted for the culture. It is a somewhat curious fact that our ideas as to suitable soil differ materially from those of our southern friends. Here it is thought that the best ground for growing strawberries is a light gravelly soil—for choice, reclaimed moor or woodland—which to the Kent or Hampshire farmer would appear most unlikely to produce good crops.

RECLAIMING LAND.

The process of reclaiming moorland is, as may be supposed, a costly one. The first operation consists in what is known as 'trenching'—that is, turning over the ground with spades to a depth of two or three feet, according to the character of the soil, great care being taken to avoid breaking through the crust into the subsoil proper. Trenching is usually done by piecework, at the rate of not less than one shilling per pole; and the cost per acre is therefore at least eight pounds. The result of the trenching is to leave a most unpromising-looking surface, which to the eyes of the casual observer resembles nothing so much as a shingly beach. The next step is to try and equalise to a certain extent the balance of power between earth and stones by gathering up a few tons per acre of the latter. The amount of stones that can be taken from the surface of an acre of ground without materially altering its appearance would afford a good subject for the delectation of the statistical fiend.

STRAWBERRIES.

Having spent as much money as he chooses on this stage of cleansing his Augean stable—and, in our opinion, the less the better, since, do what he will, at least half of the soil consists of stones—the farmer proceeds to get rid of some of the superfluous weeds by planting a crop of potatoes—one of the best patent weed-killers known. The ground is then ready for planting with strawberries, which should, if possible, be done in autumn, but is as often as not deferred till spring—the middle of March or April, according to the season. The ground must

first be thoroughly manured—no small item in the farmer's expenditure, the proper amount of manure being from thirty to thirty-five tons per acre, at an estimated price of six shillings per ton. There is a very considerable degree of skill required in the apparently simple operation of planting; and, as the whole future of the plant depends upon it, the utmost care must be taken. It used to be the custom in this district to use an implement bearing the somewhat dubious-sounding name of 'dibble,' which consists of a sharpened peg of some two or three inches in diameter, with a cross-piece at the top. With this the planter made a hole in the ground, and he then proceeded to insert therein the roots of the plant wrapped closely together. This was a barbarous method of planting a strawberry, with its spreading fibrous roots, and has been generally abandoned in favour of the orthodox method of using a trowel. It is usual to leave a space of about ten inches between each plant, and of not less than thirty between the rows; for the tread of the strawberry-picker is not delicate like that of Agag, and even with this interval it is heart-rending to see how many berries his remorseless feet crush into a pulp.

It might be thought that, having once planted his fruit, the farmer had only to sit down in its shadow, so to speak, and enjoy the profits. The reality is very different. There is hardly a month in the year in which he must not be working among it. The ill weeds, which proverbially grow apace, seem to increase with lightning rapidity in a strawberry field. In the autumn and spring large gangs of workers are employed for weeks in weeding. The weeds are collected in baskets and burnt, and you flatter yourself that never another will dare to show its head in the field. It is a fond delusion; at the first shower there spring up as if by magic chickweed, bindweed, thistles, docks, and all other abominations. And so the weeding process is repeated again and again *ad nauseam*; and unless it is constantly and efficiently carried out, good-bye to the hope of having a remunerative crop. In addition to the labour just mentioned—since this form of cultivation affords a good example of the survival of the fittest, and many plants fail to survive the inclemencies of the season—the vacancies in the rows have to be filled up, which is usually done by training the runners of the survivors over the vacant spaces.

The chief enemy which growers have to face, apart from weeds, is frost. Hardly a year passes in which the crop of the early varieties is not decimated by late frosts, and it is occasionally almost totally destroyed. In the evening a field is white with strong healthy blossoms, as if it were sprinkled with snow, and next morning a careful examination reveals that most of the blossoms have brown and shrivelled centres, which will never develop into fruit.

The varieties of strawberries which are principally grown in this district are two: the Rifleman, a small early berry, deliciously sweet, which is said to make the best jam; and the Elton Pine. The last-named is a late variety, producing much larger fruit with a slightly acid flavour. The size sometimes attained by these berries is remarkable, and it is said that six or seven selected at random have been known to weigh a pound. Other varieties, such as the Garibaldi and the Royal Sovereign, are also being cultivated; and it would appear from the marked falling off in crops of late years that some new variety is badly wanted. It is an unfortunate fact, which is certainly true as regards the reclaimed moorland, that when once there has been a crop of strawberries taken from the ground it will never bear the late variety to much advantage again. Apparently they absorb some substance out of the ground which cannot by any known process be replaced. Experiments have been tried by taking a five years' rotation of other crops off the ground and then replanting it in strawberries; but the result has never been satisfactory. Of course the small grower must be contented with the inferior results produced by repeated planting; or when his plot of ground has been exhausted for strawberry cultivation, he may plant it in raspberries.

The yield per acre from the virgin soil used formerly to be most astonishing. From two to three tons of fruit per acre was no uncommon crop; and in those days of big prices the profit was very large in spite of the fact that the productive life of the plants is so short. But nowadays, for some unknown reason, which cannot be wholly ascribed to the inclement seasons of the last two or three years, the yield per acre has diminished to a remarkable extent, and is very often less than a ton. It must not be assumed that all or even the greater part of the fruit grown in this district is grown on the virgin soil redeemed in the manner described above. A great deal is grown on ordinary agricultural ground which has been reclaimed at some remote period; but certainly the best results have been obtained from the new land. Whether it is worth while to go to the expense of reclaiming ground which, after bearing its one crop of fruit, is practically useless for other agricultural purposes is a question open to doubt; more especially as it is almost impossible wholly to eradicate broom and whins, and if left to itself the ground will in an incredibly short time lapse from civilisation into savagery.

RASPBERRIES.

Turning to the case of raspberries, the lot of the grower would at first sight appear to be a more happy one. They possess this great advantage over strawberries, that the bushes are more or less of a permanency. How long they

will go on bearing if properly cared for is hardly known. In gardens bushes of thirty or forty years old may be seen producing as good crops as five-year-olds, and the cultivation in fields is still too young to estimate what is their limit of profitable production. The expenses of growing them are, however, greater, and go far to reduce the margin of profit; and, moreover, they take longer to attain to years of discretion and productiveness. While good results are obtained in the light gravelly soil so well suited for strawberries, raspberries thrive better on a richer alluvial soil. It is usual to plant them after cleaning the ground with a crop of potatoes, as in the case of strawberries, the young plants or suckers being cut away from the old bushes in autumn. They should be planted at intervals of three feet, in rows about five feet apart. This space is necessary not only to enable the pickers to move freely about without treading down and breaking the young canes, but also to admit of the passage of a horse for weeding purposes. When only grown in small quantities it is perhaps best to train the bushes on stakes, as in a garden; but the expense and trouble of doing this on a large scale is so great that the large farmer usually trains them on two galvanised wires, the top one being at the height of four to five feet from the ground. As in the case of strawberries, the farmer's labours have only begun when he has planted his raspberries. The weeding process has to be carried out with the same unflinching perseverance.

After the fruit has been picked, the old canes and some of the young ones are cut away, and such of the latter as are to form the bushes for next year are tied to the wires; the number left in each bush varying, according to the fancy of the grower and the strength of the plant, from five to ten. This operation, as may be easily supposed, requires both trained judgment and manual skill. An error in not selecting the best canes or clumsiness in tying may ruin the whole crop. The smaller canes are simply trained upright against the wires, care being taken not to tie them so loosely as to admit of their 'wagging' too much (in which case a gale of wind may do great damage by snapping them off when heavily laden with fruit), or so tightly as to interfere with the free passage of the sap. As regards the treatment of the taller canes, opinions differ. Some years they grow so luxuriantly as to attain a height of seven or eight feet, and manifestly they cannot be treated in the same fashion as their smaller brethren. There are some who cut off a foot or two of the canes and train them straight up the wires, and think that thus shorn they bear as well as when left their full size. Others—and theirs is probably the better course to follow—have a system of arching, or 'bowing,' as it is technically called; but this again is a process requiring great skill. You must humour the

cane, commencing to curve it gradually from the root in such a manner that the bush resembles the shape of a fan. Too often the unfortunate canes are trained straight up for three or four feet, and then roughly bent and twisted horizontally along the wires, so that the stem ultimately becomes utterly gnarled and distorted.

INSECT AND OTHER PESTS.

Every three or four years the raspberries must be treated to a plentiful dose of manure, and an allowance of forty tons per acre is not too much to give them. But even with the kindest treatment, they too often disappoint expectations. It is true that, thanks to their long tap-roots, they do not feel the effects of summer droughts so much as strawberries. Nor does the frost affect them to any appreciable extent. A far greater danger is that the young canes will flower and even fruit in autumn. The canes which do so are usually the strongest and comeliest; and if the farmer is careless enough to select them as his mainstay for next season he will have but a miserable crop. There may often be seen in a row of bushes thick with foliage and hanging with fruit a number of withered dried-up sticks. These are the canes which have wasted their strength and energy to no good purpose in flowering the previous year.

But, apart from this danger, there are others and worse to be apprehended, for which there is practically no remedy. There are at least three insect pests which too often destroy the promise of the season. The first of these is the Raspberry Moth or Borer, which, when in the form of a small caterpillar, pierces the soft, juicy part at the base of the buds, and prevents the shoots from expanding. There can be no doubt that the harm done by this caterpillar is sometimes very great. It may be somewhat alleviated by forking into the ground at the roots of the bushes a mixture of soot and lime, in the autumn or early winter; but the only real remedy is the somewhat drastic one proposed by the Board of Agriculture—namely, cutting down and burning the infected canes.

Another enemy who does less real mischief, though his appearance is more alarming, is the Raspberry Beetle, who employs himself in eating out the heart of the berries while still in bud and in flower. But since these beetles only attack the individual flowers, and their capacity for food is not inexhaustible, the mischief done by them is less than it would appear to be, though at times they are seen in such myriads that it would seem likely they would destroy the whole crop. Spraying with paraffin appears to discourage but not to destroy very many of them, owing to the fact that they have wings, which they use with considerable agility on the approach of danger. The beetle is in appearance something like a dark and rather dissipated-looking ladybird.

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Last, and worst of all, is the much-dreaded Raspberry Weevil. He is a clay-coloured animal of about three and a half lines long, with dark-red legs, and is said to have 'pitchy, twelve-jointed antennæ furnished with clubs.' His character is as bad as this somewhat formidable description of his appearance would lead one to conjecture. These weevils in the daytime live in the earth at the bottom of the bushes, whence they come out at night in immense numbers to feed. They are not content with nipping off individual berries, but bite half-through the stem of a cluster of ten or twelve, so that the damage they will do in a single night must be seen to be believed. No remedial measures are of much avail. They do not come out by day, and if you

hunt for them in the earth, they either pretend to be dead, when they are practically indistinguishable from the surrounding soil, or burrow out of sight with an alacrity which would put an armadillo to shame. Some growers send out men at night to hunt them with lanterns and cloths soaked in paraffin. These they hold under the bushes and tap the wires, whereupon the weevils fall down into the cloths. It is a fascinating sport; the weevils rattle down like hailstones, and there is great satisfaction in burning your enemy in bushels, for that is the practical effect of the paraffin upon them; but it is marred by the feeling that you might as well be trying to bale out, say, the Mediterranean with a teacup.

A GAME OF WEI-CH'I.

IN FOUR CHAPTERS.—CHAPTER II.



WHEN these explanations had been made, I understood why Wang had successfully imitated Archimedes, who, according to the Latin Syntax, was so absorbed over some problem of defensive mechanism with which to protect his city that he did not perceive that the enemy had already entered it. (A similar absorption, by the way, is one of the chief dangers in the game of *wei-ch'i*, as it is in chess. And I was able to form at least an excuse for his hopeless toil, because I was already aware of his arduous literary studies: he wanted to raise himself to the rank of a 'literate,' or (not to fool with pedantic obscurities) a gentleman. For I must tell you that a knowledge of the game of *wei-ch'i* gives a man a greater standing in the polite world than a knowledge of the classics. None the less, this ambition was less intelligible than that of humane letters, because it was scarcely credible that an unlettered man would ever have an opportunity of entering the society of players. I pointed this out to him.

'You savvy good, master,' he replied admiringly. 'You very much savvy China pidgin.' Pidgin is a catholic and inestimable word; see how it serves here for that untranslatable abstraction, 'society'! 'But I tell you why, *tung chia*. In my count-a-lie'—

In Hunan, to cut him short, there was a high military official, General Ho, to wit, commandant of the provincial troops at the capital city of Chang-sha, who five years previously had offered a reward of a hundred taels (twenty pounds) to any fellow-provincial who should succeed in beating him at a game of *wei-ch'i*. Now, this challenge was not, of course, addressed to his fellow-officials (the pleasure of meeting a good player would be of more importance than a pecuniary prize to any true 'son of the 19-square

board'); it was held out as an incentive to the graduates of Chang-sha (perhaps the principal seat of classical erudition in China) to study the game, and it was well known that the General was wont to make a donation of from ten to fifty taels to those who accepted his challenge and made a fair show, though beaten; even fifty taels being sufficient to support a student for a year, the minimum time of exclusive practice considered necessary to play a fair game at *wei-ch'i*. And this challenge was open to all; the General, one of the very few military men who was also a 'literate,' would be probably more pleased to see the son of a coolie accept his challenge than the son of a viceroy. This was Wang's opportunity—a rare and beneficent one, but of a sort which is always being held out in other lines of endeavour by a paternal bureaucracy. If he could accept the General's challenge, and make a fair show; if, by some incredible blessing, he could *beat* him, his local fame would be secure for all time, like the fame of a graduate who has passed his third examination at Peking, and whose name is preserved on tablets in immortal honour of his village; and with the education he had already given himself, a victory would undoubtedly let him through one of the back-doors of the bureaucracy, without having taken his degree. All this sounds very medieval in our ears, like the prizes offered for painting and music in old Germany, which opened the doors of fame to humble talent; but China is still medieval, in some things even antique. Now is the time to preserve such medievalisms, for they are about to dip over into the modern slope.

On learning that Wang had so practical, though remote, a goal for his ambition, I immediately entered into the spirit of his dream; I not only secured him a certain number of hours of uninterrupted tranquillity daily in one of my own

rooms, but assisted him still more by taking a personal interest in the game, and frequently posing as his opponent. Although I did not pretend to master the intricacies of the board, my 'new blood' was of considerable value to him, for hitherto the poor fellow had always played against himself.

For three more years Wang continued in my service, and never for one day, except at New Year time, did he intermit his patient, persevering study of the game. Sometimes, it is true, a spirit of despair crept over him as the bewildering complications of the board grew with the increase of the lines, and then he would grow sick, and more than once I feared it would be the death of him. I was obliged to support him with wine and delicacies, and I did it willingly, even anxiously, for I was beginning to regard him with all the vigilant interest of a prize-fighter's trainer. This remote and mysterious contest, which, for all I knew, might have already lapsed through the General's death or indifference, penetrated me with the vague iceberg romance of Eastern idiosyncrasy, and I declare I was as anxious for his victory as he was. You cannot refrain from admiring, and gradually believing in, a fixed purpose, no matter what its object; there is nothing in all humanity so sublime and god-like as this common trait of tenacity. Wang had now mastered the 18-line board, and was preparing to tackle the full one.

But, alas for Wang! his brain was not entirely narrow enough to be concentrated on a foot-square board to the exclusion of his country's ill-fare. Ever since the war he had been concerned with the vital question of China's future, which no enlightened Chinaman living in daily contact with Europeans could pretend any longer to ignore. Wang now understood and spoke English well; and while waiting behind my chair at my own table and those of others—for it is the custom to take your boy with you when you dine out—he had gathered from our conversation a very clear impression of the intentions of European nations. And he did not favour the notion of the dismemberment and servitude of China. A good deal of utter bosh has been talked about the Chinaman's lack of patriotism. I doubt if so much national pride exists elsewhere. Wang was a thoroughly enlightened man; knew all about civilisation, and knew its benefits; knew Englishmen and Americans, and cordially admired them; and his unhesitating decision was, that the ancient policy of his country of driving the foreigner out of it was its only salvation. I argued this with him again and again; but his answer always was: 'We are as good as you; we want you as friends, as merchants, as teachers; but we do not want you for masters. And until we have first driven you out, we are not in a position to invite you.' I pointed out the difference between the Chinese army and the Japanese, by way of example; but

he appositely replied that the Japanese had conquered the Chinese army, but had not ventured to settle in China. 'All your armies together,' he said, 'cannot spare more than a million men to garrison the coast; and what are one million against a hundred million in the long-run?' As usual, his single-mindedness persuaded me; and, while not admitting that violence and the interruption of trade was good, I granted that we could not occupy China by force if the Chinese people resented it as a nation. This difficulty of forming a national opinion in a few years stopped him; but, none the less, he became a conspirator.

When the Germans occupied Kiao-chao, and the Russians New-chwang—confound the abominable jumble of journalistic spelling!—Wang became badly troubled; he worked at his chess-board feverishly, but he conspired as well. Then came the news of Yu Man-tzu's rebellion in Sze-chuan, embodying the Young China party's creed of ousting the obsolete Government and asserting China's independence of foreigners. 'I very sorry, master,' he said one day, 'but I must go.'

'You will be a great fool, Wang,' I replied; 'better wait and see how things turn out. You are no soldier, you know.'

'It no belong soldier pidgin to lead a nation,' he replied. 'It want a clever man, who have brains, and know what he fight against. I must go.'

I laid my hand on the *wei-ch'i* board. 'And leave this?' I said. 'You more better stop to learn the 19-line, and then perhaps can talky General Ho. Form a party, win over some high officials, and you will have something to go upon.'

Wang gazed sadly at the board; I knew it cut his heart-strings to abandon this safe and solitary study of his growth. 'You no savvy Chinese official,' he said mournfully; 'he never betray the Emperor. If he do, he betray rebel to get back again. Only can speak to the people.'

In short, Wang left me, and took the up-steamer to Hankow, whence he could now get steam passage to Ichang, if not all the way to Chung-king. Chung-king is the true centre of China, and will probably become the capital of the new Chinese Empire when the great contest for national independence begins. It stands on the Yangtze, over a thousand miles from its mouth, accessible to trade, but not to invasion, by reason of the gorges and rapids between it and Ichang; it is in the province of Sze-chuan, and has for some years been open to foreigners by treaty. On his way up, Wang proposed to stop at Yochow and take native boat by the Tung-ting Lake and Siang River to his natal place near Chang-sha, there to open a 'lodge' among his always turbulent fellow-provincials of Hunan. Peaceful and unassuming as he was, he was just the man to gain an immense influence as a demagogue. He 'talked reason;' that is everything in China. And a

cautious, thoughtful leader is just what Chinese rebellions have always lacked, because any prudent man has always known that they are foredoomed to failure. Effete and unarmed as the Chinese Government is, no rebellion, not even that of the Taipings, or of the Mohammedans in Yunnan, has ever really shaken the dynasty at Peking. But now, at last, rose a prudent man, far better versed in foreign politics than any member of the Tsung-li-Yamen, who recognised that for the first time a rebellion was demanded of *patriotism*. As I had been ready to back him for the *wei-ch'i*, so was I now ready to back him to raise a national party in arms, a thing which has never yet occurred in the history of China. Rebellions hitherto have sprung from the discontent of failures. I knew, of course, that he would fail; but I believed that, if he escaped decapitation for a year or two, he would set a ball rolling that would wipe the Manchu eunuchs off the face of history. I was not without anticipations of having a finger in the pie myself.

It must not be supposed that I had all this time been remaining idly at Kiu-kiang buying curios. The war had rather put an end to that business, owing to the anti-foreign feeling aroused, which rendered excursions into the interior unsafe; and I was not one of those drummers who buy all their specimens through the help of a *compradore* and in the shops of Hong-kong and Shanghai. Besides, the war had given me larger fish to fry. The air was full of the everlasting railway, telegraph, and mineral concessions; and I was acting as agent for a certain syndicate to construct the much-talked-of trunk-line between Hankow and Peking. This business shortly took me to Wu-chang, the capital of the Liang Hu (the two Hu provinces, Hunan and Hupeh, which form one viceregal satrapy, like the two Kiang); Wu-chang is opposite Hankow, the tea-port.

At Wu-chang, to my great interest, I was brought into personal contact with the identical General Ho of the *wei-ch'i* challenge; and the challenge, I learnt incidentally, was still open. Ho had been appointed director of the steel-rail works, positively in active progress, for the Chinese Government now hugged itself in the belief that since railways had been proved by the war to be a necessity, China was able to build them herself. Ho was a subtle, impenetrable, resolute, but withal courteous and pleasant man, perfectly at ease with foreigners, and not in the least interested in their politics or inventions. He had not the slightest belief in the railway, and was employing the

foundries in casting cannon, and using the steel rails as breastworks in a new fort he was constructing to command the approaches to Hankow; in justice to him I must state that, in addition to the directorship of railroads, he had also been appointed Imperial Commissioner for the Defence of the Upper Yang-tze, and had doubtless received his private instructions as to which of the two matters was the most pressing. Ho was, in fact, owing to his literary standing (unusual in the military class) and his connection with the high conservative faction of Hunan, in considerable favour just now at Peking; for it is a singular thing that at all the crises in the foreign relations of China—crises which invariably result in the tardy admission of new encroachments—it is the old bigoted anti-foreign party which sways the councils of the empress. Thus it happens that at the moment of writing, when China is about to remove the last barriers which obstruct its modernisation, conservatism is more rampant at the palace than it was during the Opium War.

My tale does not progress, and I dare not say anything more about the 'affairs of the nation,' although just now they are brimful of romance. Finding that the syndicate would be simply wasting money in applying for their concession, I resigned their agency, and entered Ho's service as translator of European works on fortification. His comments on this modern art were often intensely interesting; and, in spite of their antiquity, they were always shrewd. Thus, for instance, he was sceptical about long-range guns, which would hit so accurately at distances far beyond human vision; and he turned the tables on me by quoting Gordon's own advice to the Peking Government, to arm their troops with muzzle-loaders. A month later came news of the first disquieting success of Yu Man-tzu, and simultaneously of a rising of Hunanese, led by Wang Lai-chee; and it was again the General who was appointed to chastise these rebels. Ho made no to-do about the matter; suppressing so-called rebellions had been the principal business of his life; and he knew the ropes far too well to disturb himself or his leisurely duties. He issued the stereotyped proclamations, and sent the stereotyped periodical reports of victories for insertion in the *Peking Gazette*, and sat still and waited; and in due course of months the rebellion fizzled out, and a few score of unfortunate prisoners were brought by boat to Wu-chang. Among them, and honoured with a wooden cage as a ringleader, was poor Wang.



THUNDER-STORMS AND HOW TO PREVENT THEM.

By R. J. J. IRWIN.



THE ever-advancing science of the present day would seem at last to have recognised the all-important part which electricity plays in the ordinary routine of everyday life, and to be learning slowly though surely not only to enslave it for the general good, but also to safeguard the community against the many dangers which lurk beneath its potent agency.

Already we have begun to look upon telegraphs and telephones as inventions of the past, and to turn on the electric current as naturally as we do the gas in cases where a brilliant light is desirable. Again, should we require intense heat in our manufacturing processes we have immediate recourse to the 'battery,' and we even harness the electric giant to our tram-cars and motors, and compel its assistance in the perfecting of our photographic discoveries.

Thus far electricity is but the docile slave of man, who deliberately produces it for his own use and benefit, and whose only care need be that his creations stop short of actual Frankenstein proportions. *Home-made* electricity we might indeed call it in contradistinction to that other and more terrible kind which is made, not indeed 'in Germany,' but in a country remote from our terrestrial sphere and by the hand of an All-wise and Omnipotent Creator.

Of our earth-made electricity it may truthfully be asserted that it is reducible to certain well-known laws and limits, and is capable of being measured by recognised standards of intensity and power; but what known scientist can fix the length of the spark or determine the electrical potency of the lightning-flash?

Grand, however, as it undoubtedly is to watch the lightning and listen to the reverberations of the thunder, we each and all of us—say what we will—instinctively dread it, knowing it to be so frequently destructive to life and property. Now, this being so, I hope to do more than interest the general public by showing how a simple rearrangement of the so-called 'lightning-conductor' will do much towards making it an infallible *dispeller* of all thunder-storms, by enabling it to deprive the atmosphere of one of the component parts of those dreaded electrical disturbances.

To the most of us this lightning-conductor is a familiar object, which inspires us with a sense of safety if (during a thunder-storm) we enter a building to which it is attached. We no doubt have been brought up with the idea that if a flash of lightning were to visit our immediate neighbourhood it would infallibly make straight for the 'conductor' and through it pass quietly and harmlessly into the ground! This,

doubtless, is what it was *intended to do* by the accommodating engineer who prepared such a convenient passage for the visitor, for—as you may remark—the metal rod, or rope as the case may be, is most carefully insulated from the structure, which merely serves as a high point of vantage to carry the metallic road which the electric fluid is expected to traverse.

Now, is this preconceived notion of ours the correct one? I mean, is it absolutely correct in every particular? Personally, I think *it is not*. In fact, for many years I have held some very decided views on the subject; and in order to show that in my opinion thunder-storms really can be averted, I purpose explaining those views as clearly and in as *unscientific* language as I can.

Perhaps I should begin by explaining what lightning is; but were I to attempt doing so, I know I should be deafened with the indignant exclamation of '*It's electricity*' shouted at me from far and near. In adopting this answer as correct, however, I will merely remind my readers that there are different kinds of electricity, as we learned in our schooldays, and that, instead of being identical with the 'home-made' article I have above alluded to, the lightning-flash more nearly finds its counterpart in the *frictional* electricity which lecturers use for Leyden-jar experiments, and produce by the rapid rotation of a plate-glass disc between properly prepared rubbers.

Many of us will doubtless have witnessed with pleasure experiments of this kind, and will have had our memories refreshed on the subject of *induction*, or the production in another body, and without contact, of an electricity dissimilar to that experimented with. That is to say, we will have seen how 'positive' electricity obtained direct from the glass disc will *induce* negative electricity in an adjacent body upon which it acts through some non-conducting medium such as dry or heated air. The familiar example of this is the Leyden-jar, which, when charged (internally) with 'positive' electricity, has upon its outer tinfoil surface an *induced* 'negative' fluid capable of producing a brilliant spark when allowed to approach sufficiently near to the positive conductor.

Well, then, in the lightning-flash we have, on a large and magnificent scale, a perfect counterpart of the Leyden-jar discharge, in which the earth has played the part of the *outer* tinfoil coating, carrying on its surface a powerful charge of the 'negative' electricity *induced* thereon by the 'positive' contained in the overhanging cloud.

Before, however, we replace upon its shelf our old-fashioned friend, the Leyden-jar, I will ask you to assist me in making with it a simple experiment which will go far to prove the truth

of what I am about asking you to believe. It is this: I place the jar upon its stand and attach it in the ordinary way to the electric machine from which I proceed to charge it. Before doing so, however, I connect the outer coating of the jar with a brass knob which I place within a few inches of that other knob which remains in contact with its interior, and I find, as I work the disc of the machine, that when a sufficiently powerful charge has been imparted to the jar an automatic discharge occurs and a brilliant spark passes between the two knobs. This, of course, is what I anticipated, inasmuch as, the resistance offered by the non-conducting air-medium having been overcome, the two electricities have automatically reunited.

I now substitute for the first-named (or may I call it the 'negative'?) knob a cluster of brass points, and once more proceed to turn the handle of the machine with the intention of charging the Leyden-jar as before. The result this time, however, is simply *nil*! No discharge takes place, notwithstanding that the glass disc is revolving even more rapidly than before; and upon using the discharging rod I find that the jar is *really* as *empty* as it appears to be. Yet the electric connections of the jar have not been interfered with in any way, and the brass points occupy the same position as the knob for which they have been substituted. What, then, has occurred to prevent the discharge and brilliant spark we at first witnessed? Why, simply this: the 'induced' electricity has been draining away through or from the points as quickly as it became formed, and quietly reuniting with the 'positive' fluid which was being deposited on the inner coating of the jar. In fact, the process has been much the same as when water is poured into a sieve.

We may now put away our Leyden-jar and apply the lesson learned from it to the thunder-cloud, the earth, and the lightning-flash; the one being, as I have told you, the counterpart of the other. The earth, you will remember, occupies the position of the outer coating of the jar, or the one to which the spikes were attached which prevented the electrical discharge taking place.

'Exactly so,' I will be told. 'I see and understand it all now.' But the lightning-conductors we see around us *are* so many clusters of spikes projecting from the earth, and yet the thunder-clouds and the lightning seem to disregard them altogether. In explanation of this I simply say that 'something in the way in which our electrical appliances are constructed is wrong;' and I now propose to devote the remainder of my paper to pointing out to you what that 'something' is and *why* it is wrong.

The generality of persons, I think, know little, if anything, of a lightning-conductor beyond what they can ordinarily see of it—namely, that it consists of a copper band or wire rope which is generally fastened to a building with glass or earthenware

insulators, and that it has a lot of spikes at the top and runs into the ground at the bottom. This, I take it, is a generally correct description; to which I may add that after running a few feet into the ground it is usually attached to a plate of copper about three feet square and about a quarter of an inch in thickness. Now, in all this—so far as it goes—the only thing really wrong is the insulation and the earth-connection.

I look upon such an instrument as incapable of producing any (or at least any very appreciable) beneficial results, and I would merely say of it that 'if it does you no good it will do you no harm.' To my mind the real use of a lightning-conductor—or, as I prefer to call it, a '*lightning-protector*'—is in no way to attract or carry away the electric fluid from the clouds, but to discharge or quietly pass off into the atmosphere the 'induced' electricity from the earth and from the buildings, &c., upon it. The general substance of the earth, it must, however, be remembered, is not a very good conductor—I mean as though it were altogether made of metal—so that with a lightning-conductor, constructed as I have described, the induced negative electricity passed off towards the cloud is in reality little in excess of that existing in and about the copper-plate.

Hence it is that our lightning-conductors, so called, are not of more apparent utility, and seem, as I have said, to be completely ignored by the thunder-storms. Of course I am quite prepared to be told that they frequently *are* of great good, and save buildings by conveying in safety to the ground the actual lightning discharge, which otherwise would have completely wrecked them. To such persons I would merely say that were a lightning-flash to really strike their 'conductors' it *could not possibly* disperse itself through the earth without digging a big hole at the point where it left the metal and entered the ground. I may further assure them that in all probability the lightning would completely *fuse* the conductor in its attempt to pass along it from top to bottom.

As I have endeavoured to explain, then, in order to convert our 'lightning-conductors' into *lightning-protectors* we must, in the first place, do away with insulators altogether (as has already been done in some few instances), and connect them as closely as possible with the roofs of our buildings and with all metal eave-gutters, rain-water pipes, and lead flushings, &c.

I attach especial importance to having this roof-connection as perfect and extended as possible, inasmuch as the tension of induced electricity is always greatest at the point nearest the inducer; and hence during a thunder-storm there is more of it, so to speak, about our roofs and spires and high places generally than on the actual earth-surface itself. Next, as regards the connection of the lightning-rod with the ground—for, of course, it is quite correct that it should be

carried on down and into it—the object aimed at should be not so much to take it to any depth below the surface as to make the connection as complete and extended as possible—as, for instance, by attaching it to iron gas and water mains and the services therefrom, or even to iron railings which themselves have an earth-connection. A perfect connection with tram-lines or railroad metals would consequently be a very desirable one to have. I may explain, as a fitting termination to this portion of my subject, that electricity invariably passes along and is found upon the *surface* of any body or conductor instead of *in* its actual substance, and hence a flat ribbon or band of copper (as affording a greater superficial area) forms a better ‘conductor’ than one of cylindrical form.

Having thus remodelled, as it were, our existing appliances in connection with electrical disturbances, and thereby increased their efficiency, we may be perfectly satisfied that much has been done towards ensuring our safety during thunder-storms, and the robbing of the angry elements of their terrors. It remains, however, to be seen what further steps can be taken towards lessening the dangerous recurrence of the lightning-flash or even preventing it altogether.

If, then, you have clearly understood the gist of the foregoing paragraphs, you will, I think, have little difficulty in following my reasons for advocating the adoption of the following measures. My readers will, I trust, accurately appreciate the atmospheric condition of our surroundings when a thunder-storm threatens, and will bear in mind that, owing to the inductive influence of the overhanging cloud, not only the ground we walk but even we ourselves (as shown by our headaches), and everything else thereon, become highly charged with *negative* electricity with which the *positive* fluid of the cloud is endeavouring to reunite so as to establish an equilibrium.

Now, as I have shown, it is towards the roof-tops and the higher points of the surrounding eminences that this terrestrial electricity becomes attracted, for the same reason and in the same manner that iron or steel are attracted by the magnet; so that to prevent the lightning discharge, by causing a gradual and harmless

reunion of the opposing electrical forces, all that we need do is to provide a sufficient number of metallic points through or by which the induced electricity may pass away. The number of so-called ‘lightning-conductors’ which at present exist would of course—when remodelled in the manner I have described—constitute a goodly number of such points; but these might be efficiently and almost indefinitely supplemented at a comparatively trifling outlay by the adoption of the following suggestions:

In the first place the ridges or apexes of our roofs should invariably be covered with *iron*, made in lengths, and similar in form to the earthenware tiles now in ordinary use, but having attached to them at suitable intervals *sharp* metal spikes, which may be so arranged as to form a portion of any ornamental pattern that may be desired. These ridge-coverings should be attached by wrought-iron straps (running either under or over the slates) to the ordinary metal eave-gutters, which latter must in turn invariably have a close metallic connection with the top ends of the rain-water pipes and hopper-heads instead of being only laid into them as they generally are. The aforesaid wrought-iron straps should be firmly screwed to the spars or rafters, and connected with both eave-gutters and metal ridge-covering by bolts and nuts. Finally, all chimney-stacks and ornamental finials, &c., should carry on their highest points clusters of spikes in metallic connection with the iron ridge-coverings aforesaid, and similar to those at present used to complete the tops of our so-called lightning-conductors.

In conclusion, I beg earnestly to offer a word of advice to every one having to do with lightning appliances, and that is to be always most particular in keeping the terminal spikes both *clean* and *sharp*, as much of their efficiency is found to depend upon their being maintained in this condition. With this parting injunction I leave my readers to think over for themselves the reasons I have put forward in proof of the assertion that thunder-storms can be prevented. The question is—Would the adoption of these suggestions have the desired result? As an architect I have had some experience of these matters, and *I believe it would*.

HIGHLAND SEERS.



IT is easy to ridicule the idea of any human being possessing the power of peering into the future, and no doubt many self-styled prophets, wise after the event, have been impostors pure and simple. But that genuine manifestations of a phenomenal prescience have existed, and do exist, there can be no reason-

able doubt. The common explanation of this attribute is, that the possessor of it is endowed with an abnormally acute intelligence, which suggests the occurrence of future events, hidden from the mental view of the ordinary man. But that explanation is obviously incomplete and unsatisfactory.

Where, then, lies the explanation of *clairvoyance* or second-sight? That is a question which has

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exercised the minds of wise men in all times, and it may be doubted whether a satisfactory answer has yet been given. The suggestion may, however, be made that, as in rare instances men are gifted with genius (which, after all, is something more than a mere 'capacity for taking pains'), so, in still rarer cases, may there be men upon whom the gift has been conferred of discerning—within a very narrow compass, it may be—certain events which lie hidden in the womb of the future.

In the Highlands of Scotland the gift of second-sight was, until comparatively recent times, a cardinal article of faith among the people. In the more remote parts, indeed, it is still firmly believed in; and at the present day one may meet men and women who are popularly believed to have 'the sight.'

It can be readily understood that among a people who, by nature, training, and environment, are superstitious a belief in the occult should be prevalent. But superstition and a belief in second-sight need not necessarily go hand-in-hand. Dr Johnson, in his *Tour through the Hebrides*, devotes particular attention to the subject. Superstitious to a degree, he strove to reconcile with his strong common-sense the deep impression left upon his mind by the evidences which he saw of the gift possessed by the seers, and the extraordinary accuracy of their 'sight.' He summed up his conclusions thus: 'By the second-sight seems to be meant a mode of seeing, superadded to that which Nature generally bestows,' and consists of 'an impression made either by the mind upon the eye or by the eye upon the mind, by which things distant or future are perceived and seen as if they were present.' Martin, who is our principal authority on the Hebrides of the past, gives his impressions thus: 'It—the sight—consists in seeing an otherwise invisible object without any previous means used by the person that sees it for that end; the vision makes such a lively impression upon the seers that they neither see nor think of anything else except the vision as long as it continues, and then they appear pensive or jovial according to the object which was represented to them.'

A peculiarity about those who saw, or were supposed to see, a vision was, that they kept their eyelids erect and continued to stare until the vision vanished. Martin gives an instance of a seer in Skye, the inner part of whose eyelids was turned so far upwards during a vision that after the disappearance of the object he found it necessary to draw them down with his fingers; and cases are on record where the seer found it desirable to employ others to draw them down for him!

Incomparably the greatest of Highland seers was Kenneth Mackenzie, better known in the Highlands as Coinneach Odhar, who lived and prophesied during last century. He was a native of the island of Lewis, but migrated when young

to the mainland, where he attached himself to the household of his chief, the Earl of Seaforth. Coinneach was, for a man of his station, very intelligent, and it is not unreasonable to argue that some of his prophecies may have been the outcome of his natural shrewdness. He foretold, for example, the construction of the Caledonian Canal at a time when no such scheme had been mooted by any engineer of his day. But how can one explain the wonderful fulfilment of the disasters which he predicted for the Seaforth family? It was his last prophecy, and was uttered when on his way to the stake, there to be burnt alive as a wizard, by order of Lady Seaforth. He had given mortal offence to that lady by conveying to her, at her own request, the result of a vision which reflected upon her husband's constancy. The explicit nature of Coinneach's last prophecy is shown by the following record of it. These are the seer's words: 'I see into the far future, and I read there the doom of my destroyer. Ere many generations have passed, the line of Seaforth will become extinct in sorrow. I see the last male of his line both deaf and dumb. I see his three fair sons, all of whom he will follow to the grave. He shall sell his gift lands, and no future Seaforth shall rule in Kintail. A black-eyed lassie from the East, with snow on her coif, shall succeed him; she shall kill her sister, and she shall be the last of the Mackenzies of Seaforth. In those days there shall be a daft Lovat and a buck-tooth Chisholm, and they shall be the last direct males of the line. When these things are, Seaforth may know that his sons are doomed to death, and that his broad lands shall pass away to the stranger, and that his race shall be no more.'

Every detail of this prophecy was fulfilled more or less literally. Francis Mackenzie, Lord Seaforth, the last male of his family, was deaf and dumb, the result of an illness which he had contracted: 'I see the last male of his line both deaf and dumb.' His three sons all died before their father: 'I see his three fair sons, all of whom he will follow to the grave.' He was obliged, on account of financial difficulties, to sell his Kintail property—'the gift lands,' as they were called—which, according to tradition, were gifted by Alexander III. to the progenitor of the Mackenzie family, Colin Fitzgerald, who saved the king's life when hunting: 'He shall sell his gift lands.' He was succeeded by his daughter, Lady Hood, whose husband, Sir Samuel Hood, had died in India. As she was in widow's weeds when she returned to England, the seer's prophecy that a 'black-eyed lassie from the East, with snow on her coif, shall succeed him,' came literally true. The prophecy that she should kill her sister was not literally fulfilled; but in view of the fact that her sister died as the result of a carriage accident when Lady Hood (afterwards Mrs Stewart-Mackenzie) was driving, the

prediction came to pass in a sense, after all. The 'daft Lovat' and the 'buck-tooth Chisholm' of the prophecy actually lived during the time of the last Lord Seaforth. The concluding part of Coinneach's prediction has come too true; for the 'broad lands' of the Seaforth family have indeed 'passed away to the stranger.'

Coinneach Odhar's sayings have been current in the Highlands for many years, and even at the present day they have a limited currency among the West Highland peasantry. They were not unknown to Sir Walter Scott, who makes reference to them in some of his letters (*Lockhart's Life*).

Tradition says that the gift of second-sight was acquired by Coinneach by means of a white stone which he found on his breast one day upon awakening from a hillside slumber. It was

asserted that this stone gave the possessor miraculous power, and was used as a kind of telescope for peering into 'the dim, uncertain future.' When the seer was on the way to his death, he threw the stone away, after uttering the fatal prophecy about the Seaforth family. It is said to have fallen into a pool of water which is now Loch Ussie. At the bottom of this loch (so tradition has it) the stone shall remain until an Elisha, with well-defined characteristics, shall succeed the Highland Elijah. The successor, who is to find the magic stone inside a pike, has not yet appeared; so, presumably, the stone will remain at the bottom of Loch Ussie until he does. For all the successors of Coinneach Odhar have indeed been 'minor prophets' in comparison with him.

NO MAN'S LAND.

I may not hear the summer rain upon the parched ground
fall,
Nor can I watch the shadows wane when sinks the great
red ball;
Though hosts on hosts of startled ghosts troop ready to
my call.

THE wind rustles through the poplar-trees that sway in
the garden hedge;

The little blue-tit has his hole in the wall and his perch
on the window-ledge;

The holly-tree kisses the warm red bricks, as it always
used to do;

And the horse-shoes lie where we laid them down, a
motionless, mocking crew.

The grass on the lawn, so dank and long, is the grass
that once was ours—

Ours in the desolate autumn gales, ours in the summer
showers.

Six bonny days out of seven it lay, a carpet white,
yellow, and green,

While the seventh was claimed by a jingling fiend, the
conquering mowing-machine:

I hear it now as I hear the birds in the apple-trees
chatter and call,

As my footsteps sound on the worn old paths that never
could weary nor pall.

The peonies burst in the summer's prime 'neath the
smiling sunny sky,

Their heavy heads hang down to the earth that will
cover them up when they die.

The chinks in the tottering summer-house let the trick-
ling rain-drops in,

While the spiders are spinning silvery webs from the
ceiling down to your chin.

The lilac shadows the privet hedge, purple and spotless
white:

Does it smell as sweet as it used to do in the days
beyond our sight?

The stars come out, and the sparrows hush in the
sheltering holly-tree,

The owls 'tu-whoo' in the stackyard dim, and the fox
barks distantly;

But far away, where the firelight falls, and shutters hide
Charles's Wain,

I hear the blackbirds whistle and sing in the sun after
heavy rain,

And I see the growing daffodils spring and the bright
beech-buds unfold,

Or watch the sea birds hover and sink when the east
wind sweeps the wold;

And if I tire of the dawning year, and pine for a
summer day,

'Tis here as soon as my thought is sped, to brighten the
gloom and the gray.

The morning breaks on the yellow corn, golden as gorse
in bloom;

And there comes the clang of the reaper sails as they
gather the wheat to its doom.

The partridges rise with a whirr and a cry as I trample
the stubbles down,

And the guns ring clear where the leaves are sere and
the fern is a rich ripe brown.

When the year lies dead and the snowflakes come to lull
Mother Earth to sleep,

And diamonds deck the sun-kissed fields, where daisies
may not peep,

The sun goes down in a blaze of red, and I wander
homeward away,

To dream that To-morrow 'twill be the same—To-morrow
is never To-day.

To-day is claimed by the waves and the tide; 'tis only
written in sand,

But memcry knows no time nor tide: her kingdom is
No Man's Land.

B. M. DANBY.